

REMARKS

This Response, submitted in response to the non-final Office Action dated June 19, 2006, is believed to be fully responsive to the points of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

Claims 1-11 and 13-15, 19, and 20 are pending. Claims 1-11, 13 and 19 have been rejected under 35 USC 103(a) over U.S. Patent No. 4,093,869 (Hoffmann), in view of U.S. Patent No. 2,732,509 (Hammerstrom). Claims 14, 15 and 20 have been rejected under 35 USC 103(a) over Hoffman, in view of Hammerstrom in further view of US Patent No. 5,220,228 (Sibata). Applicants respectfully submit the following comments in support of the patentability of the Claims. Reconsideration of the rejections in view of the following remarks is respectfully requested.

1. Claims 1-5 and 13:

Claim 1 is directed to a synchronous electric machine and recites, in part, that the DC field coils and the AC field coils are circumferentially arranged at the same radial distance from the shaft, as shown for example in FIG. 5 of the present application.

In contrast, the machine of Hoffman employs concentrically arranged DC field coils 57 and AC field coil 62, as shown in FIG. 2 of Hoffman. Applicants note that FIG. 3 of Hoffman is a partial electric schematic diagram of the alternator shown in FIG. 2. In addition, Hoffman winds AC field coil 62 about air cores.

To supply these deficiencies of Hoffman, the Examiner cites Hammerstrom, which is directed to an AC dynamo-electric machine. The machine includes a rotor 14, which is shaped to present four poles 28, 29, 30, 31 (Col. 3, lines 52-53 and Fig 1). The stator 13 includes DC poles 15 and 16 and stator output poles 19 and 20. The Examiner asserts that it would have been obvious to replace the stator pole configuration of Hoffman with that of Hammerstrom for the purpose of increasing the starting torque of the stator. Applicants respectfully disagree for at least the following reasons.

First, Applicants respectfully submit that the Examiner has not motivated the proposed substitution because replacing the stator pole arrangement of Hoffman with that of Hammerstrom would not increase the starting torque of the starter, as asserted. On the contrary, for the Hoffman machine, the physical location of the AC and DC stator coils

does not affect the starting torque. Regardless, the Examiner has neglected the different functions of the machines in Hoffman and Hammerstrom. The objective of Hoffman's machine is to supply the necessary DC current to the field winding of the main machine. In contrast, the objective of Hammerstrom's machine is to produce torque.

In addition, Applicants note that Hoffman selected the arrangement of DC and AC stator coils shown in FIG. 2 in order to arrange the magnetic axis for the AC coil 62 in space-quadrature with respect to the magnetic axis of the DC coil 57. (Col. 4, lines 47-58). In contrast, Hammerstrom employs an arrangement of AC and DC stator coils that are purposefully arranged so as not to be in space quadrature. Namely, the DC stator windings are skewed relative to the AC stator windings in Hammerstrom, for the purpose of increasing the torque transfer. As shown in FIGS. 1 and 4 and explained in Col. 5, lines 31-37, the stator poles 19 and 20 are not spaced a corresponding 90 degrees from field poles 15 and 16. Thus, if one were to follow the teachings of Hammerstrom with respect to the arrangement of the stator poles and associated coils, and replace the stator pole and coil arrangement in Hoffman with that in Hammerstrom, one would render the machine in Hoffman inoperable. Consequently, Applicants respectfully submit that one skilled in the art would not have combined Hoffman and Hammerstrom in the manner suggested by the Examiner.

For at least these reasons, Applicants submit that Claim 1 is patentably distinguishable over the cited art, either alone or in combination. Further, as claims 2-5 and 13 depend from Claim 1, these claims are also patentably distinguishable over the cited art for at least these reasons. In view of the above, Applicants respectfully request that the rejections of Claims 1-5 and 13 under 35 USC 103(a) be withdrawn.

2. Claims 6-11 and 19:

Claim 6 is directed to an electric machine and recites in part that the DC field coils and the AC field coils are circumferentially arranged at the same radial distance from the shaft. In contrast Hoffman employs concentrically arranged DC field coils 57 and AC field coil 62, as shown in FIG. 2 of Hoffman. In addition, Hoffman winds AC field coil 62 about air cores. Hammerstrom employs a skewed stator pole arrangement for the purpose of increasing the torque transfer.

Applicants respectfully submit that claim 6 is patentably distinguishable over the cited art, for reasons analogous to those presented above with reference to Claim 1. Further, as claims 7-11 and 19 depend from Claim 6, these claims are also patentably distinguishable over the cited art for at least these reasons. In view of the above, Applicants respectfully request that the rejections of Claims 6-11 and 19 under 35 USC 103(a) be withdrawn.

3. Claims 14, 15 and 20:

Claims 14, 15 and 20 have been rejected under 35 USC 103(a) over Hoffman, in view of Hammerstrom, in further view of Sibata. Claims 14 and 15 depend from Claim 1. Accordingly, Claims 14 and 15 are patentably distinguishable over Hoffman and Hammerstrom, for at least the reasons presented above with reference to Claim 1.

Claim 20 depends from Claim 6. Accordingly, Claim 20 is patentably distinguishable over Hoffman and Hammerstrom, for at least the reasons presented above with reference to Claim 6.

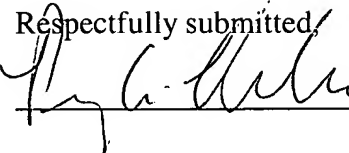
The Examiner cites Sibata to provide the flared extension recitation. However, Sibata doesn't supply the above-discussed deficiencies of Hoffman and Hammerstrom with respect to Claims 1 and 6. Accordingly, Applicants respectfully submit that claims 14, 15 and 20 are patentably distinguishable over the cited art, either alone or in combination.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

Please charge all applicable fees associated with the submittal of this Amendment and any other fees applicable to this application to the Assignee's Deposit Account No. 07-0868.

Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number below.

Respectfully submitted,


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Sept. 18, 2006
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